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L.I.S.T.ING

December
1985

\$1.50

MEETING NOTES NOVEMBER 3, 1985

The Sec'y-Treasurer reported that there are currently some 115 active members (13 more have not paid dues) and that the treasury should show a small balance on January 31st, the end of our fiscal year. So far, about 20 members are paid up to some date past February '86.

Solicitations for nominations were made. The following offices need to be filled at the December meeting.

President
Secretary
Treasurer } may be combined
Newsletter editor & staff (Production, Mailing, Back Issues)
Corresponding Secretary
Librarian - Paper (books, exchange newsletters)
Tapes
Data Base coordinator

NOTICE: The Dec.1 meeting will have a hardware session. Please bring your Oliger boards, low power soldering iron, an extension cord, wires, etc. Try to come at 1:30 p.m.

So far, Chuck Russell has volunteered to continue as tape librarian and Jeff Street will continue as corresponding Sec'y, and will handle the back issues job. Myles Cohen was not present, but it was hoped that he would continue to manage the data base.

The remaining positions are open to nominations from the floor. Each position must be filled, if LIST is to continue as a viable organization. This is your chance to contribute. Members may nominate themselves.

The December meeting was scheduled for December 1st, at the Huntington Public Library. 2 PM

DISCUSSIONS AND DEMOS

Nazir P. is still trying to organize the hardware group. Please contact him if you wish help in building your "Oliger-emulator." SEE THE HARDWARE MEETING NOTICE ABOVE.

Paul D. demoed his IF one and Sears RGB monitor/reciever with a number of graphic games for the Spectrum. He tried to interface his IF one and Brother EP-44 at the meeting, but had a bad cable (Pins 2-3 reversed). Paul ran JSW II and showed us IF3.

Cedric B. described a recent trip to Europe and what he saw in the shops. He said that, contrary to most reports, he saw no 3" diskettes in any of the shops he visited in Holland. He did see the Opus Discovery One system for about \$270 and the Amstrad (which has a 3" built in). Shopkeepers told him the Spectrum plus had a 30% return rate due to power supply problems. He also saw a C5. He was not impressed.

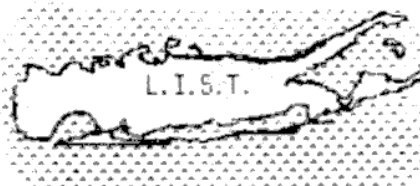
Stoney McM was unable to attend and says the loaner QL was shaky. If he gets another, we may get a peek in December.

The Zebra BBS is reported to be readying to support the X-Modem protocol.

An outfit called Software Plus, in Brooklyn, reportedly has some good deals on printers.

The use of thermal paper was discussed. Members were reminded that thermal paper deteriorates (particularly if exposed to light or heat). Any listings, graphic, or correspondence you wish to keep should be photocopied. For the same reason thermal mailing labels are considered risky to use. Transparent tape destroys the printing on thermal paper quickly, so only contact cement or "glue sticks" should be used to fasten such labels to an envelope. Remember that, even then, the label will fade quickly if exposed to light or heat.

Most library materials borrowed at the last meeting were returned.



SUBSCRIPTION NOTICE

Please check your mailing label. Above your last name you will see the month and year in which you will receive your last issue of LISTING (LLIST) Newsletter. If this number does not agree with your records please let us know. This is a good time too, to request information on specific subjects for next years newsletters or just let us know what your special needs are.

LIST GROUP
P.O. BOX 438
CENTERPORT, N.Y. 11721-0438

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These notes on Stewart N.s visit to U.K. were not printed in the November issue.

MEETING NOTES cont'd!

The U.S. QL is slightly different from the U.K. version both hardware-wise and in the available software. The changes in hardware have apparently made a few program incompatible and Stewart also reports that Timex Portugal is going to produce a "2048" for the local market. It will have a Spectrum bus, no cartridge slot, 1 joystick and sound. Apparently it is designed as an entry level machine, but aimed at disk drive compatability (who needs carts when disks are available?)

Lastly on the disk system, Zebra has noted that some failures in the disk controller may be due to mechanical separation of the 16K RAM pack tucked away inside. Simply repairing the loose connectors or adding a new RAM pack should solve the problem.

MOVED?

Then let us know so
you won't miss any
issues of

L.I.S.T.ING

Write to:

LIST

P.O. BOX 438

CENTERPORT, N.Y. 11721-0438

USING ZXLR8 FOR FILE HANDLING

by Steven Kaye

It arrived almost unnoticed, yet it is the answer for anyone seeking a low cost, file handling operating system for small-scale computer applications. "IT" is ZXLR8, a software package that gives your old ts/1000 the convenience of fast loading and file handling capabilities similar to expensive disc drive systems.

Yet, ZXLR8 is not without its faults, in fact, it was one of the faults that introduced me to this great operating system. When purchased as software on tape, the program does not seem compatible with all tape recorders. I was originally given the program by a friend who purchased it and found it impossible to get it working. He was not able to get it calibrated to work with his computer cassette recorder. My friend was sure that it would not work with my "garbage" tape recorder which would not load 0-SAVE programs. When I tried initially to calibrate the program I also encountered difficulty. After much time and trial and error experimentation I discovered the correct calibration settings simply by trying values recommended in the documentation booklet. Surprisingly it worked. Even though it was quite a pain loading the ZXLR8 tape and then playing with the loading/saving of programs, I was hooked by it. Not only did it provide loading/saving at warp speed, it also gave me a checksum that informed me that I had good loads. But this was still only the tip of the iceberg. After playing with ZXLR8 for several weeks, my friend "burned" it onto an EPROM which was placed in the John Oliver 8K EPROM read board. Only later did I learn that the program is now available already on an EPROM, and it contains an enhancement that makes it even more valuable.

With ZXLR8 under the hood, my computer became a new machine. My first real application was the transfer of my large student database program to this new system. Prior to using ZXLR8 it would take over 12 minutes to load the entire database. I never minded this delay because once the program was up and running it would save me hours of annoying clerical work. Anyway, I could always spend the loading time looking into the refrigerator deciding what to take as a snack while doing my work. Now the program loads quickly although it deprives me of my snacks. While it is convenient, the quickload feature is only a small part of ZXLR8. The program also gives you a function which is similar to the disc "catalogue" function. It scans the tape and gives you, on screen, a listing of the files contained on the tape as well as information on file type and length.

The real magic of ZXLR8 is its file handling capability. It is possible to take data from a program, save it on tape independent of the program, and load it into another, completely different program. There are four different types of files that can be stored, each using a specific new command. The command BS or "graphics save" saves the display on your TV or monitor screen. DS is the "data save" which allows you to save anything stored within a specific numeric or string array. BS is the command for "binary save" and it allows you to save any number of contiguous bits that are stored in memory. HS is the "high resolution graphics save" which stores data from memory location 8192-14335. The area of memory utilized by Advanced Interface Designs' high resolution graphics board.

My primary use of the file handling capability is the movement of large quantities of data stored in string arrays, from one program to another. I have recently used the file handling capability to transfer the list of student names and homeroom classes from the database to my gradebook program, a variation of the one that appeared in SYNC several years ago.

To perform this operation, I would first load the database. Then I would break the program and enter the RAND USR call to call ZXLR8. The computer then requests a filename. I enter the filename "names" then enter the command DS. The computer then requests the name of the array in which the data is stored. Then the computer instructs you to start the tape recorder and you save "names" to tape at a speed which several years ago would have been considered impossible on this "pokey little" computer. Following this operation, I would "new" the computer, load the gradebook program and run it to initialize the variables. When I first tried to transfer data I failed to initialize the variables and found that it was impossible to get the data to load. After the second program is set, you call ZXLR8 again and instruct it to DL "data load". The computer requests the array name. You must give it the name of the array into which you wish to load the data. The two arrays can contain different letters but the second array must be large enough to accommodate the incoming data. As an example, my student name list is C\$(150,22). I saved the data as an array named "names" and loaded it into an array within the second program named A\$(150,22).

The only limitation which I have discovered in using this type of data transfer is that it limits you to moving a single array at a time. The convenient string handling capabilities of our computers allow us, however, to combine files from several different arrays into a new string array which is suitable for saving. As an example, if I wish to transfer both student names and homeroom classes from the database to the gradebook, I would simply write a short basic routine within my database that would create a new array that contains the desired information. This example shows how I can combine the data from 2 different arrays and permit ZXLR8 to transfer both files simultaneously using the data save/load functions that were discussed previously.

500 DIM 0#(250,26)
510 FOR I=1 TO 250
520 LET 0#(I)=0#(I)+R#(I,3 TO 6)
530 NEXT I

In this example, the student names are stored in 0# and the homeroom information is part of the data stored in R#, residing in the 3rd to 6th spaces of the array.

Once the data is transferred to the new program, it can be kept in this configuration or read into two arrays using a variation of the subroutine listed above.

In future articles I am planning to elaborate on some of the other file handling techniques and features offered by this tape based operating system.

ZXR8 is available from Russell Electronics and is an excellent investment for anyone planning to use their Timex computer for serious data handling applications.

Russell Electronics
R.D.1, Box 539
Centre Hall, Penna. 16828

Available on EPROM for \$21.00 or on tape.
Write for information. YOU MUST TRY IT TO BELIEVE IT, ANYHOW IT IS MUCH LESS COSTLY THAN A DISC SYSTEM.

TS1000 S. KAYE

Bulletin Board Listings

516 AREA CODE
516-561-6590 LICA LIMBS
516-569-0589 STAR TREK
516-326-2907 GOOD TIME CHARLIE
516-333-2858 METAL
516-569-0589 MODERN MADNESS
516-868-8328 NYMAC
516-561-8596 TELE-TRENCO

201 AREA CODE
201-549-7591 J.A.C.G.
201-992-9893 THE HOSPITAL
201-666-7896 DAVID'S PLACE
201-467-1303 ORIENTAL XPRESS
201-498-2958 COMPUTER FORUM
201-875-2635 EPSON-NET BBS
201-549-7591 ATARI
201-892-8172 THE BEACH
201-833-2846 COMSARD 64
201-627-5151 CONFERENCE TREE
201-666-7896 DAVID'S PLACE
201-462-0435 DIAL YOUR MATCH#1
201-666-2646 GENERAL STORE
201-790-6795 PHOTO 80
201-932-3687 PMS
201-747-6756 PMS
201-837-8504 THE RADICAL BOARD
201-828-9498 COCO CREATIONS
201-862-4956 SKYLANDS BBS
201-790-4177 U.S. ENTERPRISE
201-663-3893 OMEGAMON BBS
201-446-1421 HAMMATT HELP LINE
201-233-0010 JR. HIGHTECH
201-972-0372 ATARI OUTPOST
201-494-3649 MICROPHONE
201-972-0649 APPLECORE BBS
201-232-1730 B.A.C.E. BBS
201-663-1867 COMMODORE 64 DEPOT

203 AREA CODE
203-744-4444 BULLET 80
203-629-4375 EDUCATION 90
203-966-8889 CONNECTKUT PC
203-746-5763 TELECOM-7
203-281-7287 MET-CHEM BBS
203-869-3456 THE SWITCHBOARD NETWORK
203-869-7569 THE FIREHOUSE

NOTE: The editors and publishers of COMPUTER LIVING NEW YORK can not take responsibility for the accuracy of the above list, however an effort has been taken to insure that the above numbers are correct.

To have your bulletin board system listed in future months, please mail it to Computer Living, 5793 Tyndall Avenue, Riverdale, NY 10471.

SYNOPSIS

Ian Robertson

SINC-LINE August 1995

UPDATES: I want to thank all of you who wrote to me with advice and comments on just what you would purchase, i.e. disc, mofadriver, microdrive (both Siaclear and A & J), Spectrum, Portuguese TS2068, etc. To bring you up to date I bought a Spectrum Plus, laterface 1 and 2 Microdrives. There were no quality problems at Siaclear! For example - one of the drives was perfect while the other was not (it was being kind), the cable joining the drives to laterface 1 had an intermittent open circuit and the heat sink inside the Spectrum was barely held on by the bolt through the regulator/board. But once those items were corrected I am glad to report that all is running well and lives up to expectations. The drives are actually quieter than I anticipated and the access/loading times are quite acceptable. I finally got Nisont C running and believe it or not it was that dreaded 'tape recorder output' problem that we all know and do not admire. It took 7 recorders until I found one that would work. It was the TS2020 with a 7.5 volt DC power supply that did the job. Since purchasing ARTWORK (GRANEX INTERNATIONAL 17429 24 RILE ROAD WASHINGTON NJ 08094) I have been pleased with the User friendly aspect of it. As if this needed reinforcing I purchased another program of this type called THE ARTIST (Isotek Int'l.). While this is the top rated UK Spectrum program (according to the June issue of YOUR SPECTRUM), it not only lacks some of ARTWORK sophistication but is also far from being User Friendly. All things considered ARTWORK is still a BEST BUY.

TS2068 The big news is the number of disc drive interfaces we now have to choose from - WHAT A DIFFERENCE! On the local scene we have one from LAKEN ELECTRONICS, R.R.2, HAWK, ONTARIO, ONA 200, telephone 613-825-2680. It is a very reasonably priced and very well assembled controller board complete with all cables and connectors. For \$119.95 (\$89.95 US) plus shipping, you get an interface that is compatible with the TS2068 and the Spectrum emulator. At the moment there are two happy TS68 members whirling away with this system. It supports one Shogun 5400 3550 drive (160k total). While this may not seem like a lot, think of those thousands of happy Apple Users with only 128k and one drive! The BBS is on a 2k epron and on a supplied disc. As improvements are available you will be notified and an updated epron will be available. ALL THINGS CONSIDERED - THIS ITEM IS ANOTHER BEST BUY. One other new disc system is the 3rd Times Portugal being sold by Bob Dyl of THE ENGLISH MICRO CONNECTION 15 KILBURN COURT NEWPORT K1 02840 telephone 461-949-2805. The 3rd discs are available locally from Excellence at 319 College St. 901-6941. The Portuguese system will also be carried by ZENRA SYSTEMS 79-06 Jamaica Ave. JAMAICA NY 11421 telephone 718-276-2385. The yet to be released disc system of John Oliver/Kay Kinsley from THE JOHN OLIVER CO. 11601 WHITNEY DR. CUMBERLAND IN 46229 sounds like a winner too. It will consist of 3 boards (eventually) and the specs, indicate that it will be hard to beat. For information send a SASE to John at the above address. Good news for anyone requiring TS2068 repairs. The following two locations will perform repairs, (1) TS CONNECTION, 3832 WATTESON, CINCINNATI, OHIO 45227, telephone 513-271-3575 from 8 am to 10 pm EST, (2)

212/718 AREA CODES

718-937-2729 APPLE CIDER
212-222-1607 BILL'S MAC BBS
718-258-2062 APPLE SAUCE BBS
718-499-1633 ELECTRONIC CALL BOARD
718-351-5678 APPLE EXPANOR
718-727-4290 NIGHT SHIFT
718-625-6931 CURA
718-615-0096 NEWS EARTH CENTRAL
718-351-2710 ENTERPRISE
718-420-8889 GANDOLF'S
212-579-2869 FORDHAM JESUIT
212-629-0526 MAD MACK
718-934-5573 MAGIC BALLROOM
212-757-3387 METRO CPU
718-646-6951 138 BBS
718-531-4982 XANADU
212-796-3052 RIVERDALE 64
718-727-4290 NIGHT SHIFT
718-494-6650 ARCNET
718-686-7875 HAMNET
212-269-4150 A-TREE
212-807-1257 CHELSEA SQUARE
212-781-4723 FRIENDS
718-258-7701 ATARI LIBRARY
718-615-0096 ENC
718-934-0774 ENC
718-709-5195 BBS ENTERPRISE
718-848-5673 GREYHAWK'S GALLERY
212-882-0547 'BOARD OF ED'
718-648-1063 WIZARD'S KEEP
718-441-3239 TWILIGHT ZONE
718-967-3789 RESISTANCE
718-296-2229 ZEBRA
718-259-6112 APRAKOS
718-452-1539 B.O.C.S.E.T.
212-220-8557 BRONX DISTRICT 10
718-746-3778 TITAN'S TOWER
718-479-5746 T.E.S.A.
718-232-2626 SHADOW WORLD
718-332-6959 MODERN OVER BROOKLYN
718-849-3422 TIME TUNNEL
212-219-8519 SWASHBUCKLER
718-332-5851 OUTPOST
212-966-0575 THE INVENTION FACTORY
212-431-1194 BIG BROTHER
212-671-1484 DELTA HOUSE
212-475-4593 HILLTOP
718-273-0447 EARTH NEWS
718-934-0774 VALHALLA
212-588-0243

TIMEX PRODUCT SERVICE CENTER, PO BOX K, 7004 MURRAY STREET, LITTLE ROCK, AR 72203, telephone 501-272-1111.

SPECTRUM There are several new and some not quite so new programs that have simply blown my mind. I'll name a few: BETA BASIC 3.0 update of version 1.51, NEGA BASIC (from Your Spectrum), BLAST is truly sophisticated compiler, SUPERCODE 3 (lookit with 152 utilities), MUSIC TYPewriter (compositional music and prints out 80 column) and ALLEN 8 (game). All of these are available from Bob Dyl at ENC. So far I've mentioned YOUR SPECTRUM twice and not elaborated. It is a GREAT Spectrum dedicated magazine available from YOUR SPECTRUM, SUBSCRIPTIONS, 14 RATHBONE PLACE, LONDON W1P 1DE, U.K. at \$25.00 (pounds sterling). Like all UK publications they are quite game oriented. They also take Mastercard and Visa, but be sure to include your cards expiry date. I know they take plastic because that is how I paid for my subscription, back issues and Mega Basic. WARNING - If you buy U.K. software - make sure to copy it IMMEDIATELY upon receipt. I have had four tapes that either had inside the case or break off inside due to binding. To make matters worse, U.K. cassettes do not have screens. Therefore you cannot take them apart and add lubrication to the rollers like you can with North American cassettes. To add yet another insult to injury I have had several U.K. tapes that are of such a low bias that they do not have adequate volume to load consistently. This is where a Radio Shack mini amplifier helps. I am presently in the process of adapting the Spectrum 1 from PAL to NTSC and to use a composite video monitor. I have ordered the TS2068 34.122 Mhz Y1 crystal and will see what it does to steady/upgrade the picture. More in my next column. I have already converted the Siaclear power supply by replacing the transformer with a 115/18VCT 1 amp 60 HZ transformer.

TS1000 Exciting news! Peter McMullen's WORDSINK II.5 and WORD FONT VI.2 are finished, released and a copy of each is residing in my ever expanding software library (300+ cassettes). WHAT A PAIR OF PROGRAMS! If you have a centronics interface (either TS1000 OR TS2068) Peter will sell you a custom version for it (at the same price). This simply means that if you are presently running a TS2068 word processing system and you have a TS1000/Z80 hanging around - you can put it to work, either as a backup system or as a separate system (sharing the same centronics interface). All this for \$20.00 (VHS II.5) and \$15.00 (VHS VI.2) plus postage. They are available from PETER McMULLEN 2340 QUEEN STREET EAST TORONTO ONT. M4E 1G9 telephone 416-474-5171, or from INTEGRATED DATA SYSTEMS 30 BRIDGEMOUNT ROAD TORONTO ONT. M1L 2M1, telephone 416-897-6380. IBS takes plastic. I have used both programs (more than once) and consider them comparable to using Microfit and Taspaint (for the TS2068) together (if that were possible). TRULY A BEST BUY!! The other almost impossibly to believe item is the JOHN OLIVER VIDEO UPGRADE for the JLS0000 Plus. This hardware upgrade makes your humble TS1000/Z80 into a flicker-free colour computer with upper/lower case characters and a SLOW MODE THAT RUNS ALMOST AS FAST AS THE FAST MODE. What a way to liven up a basic program! It prints out upper and lower case on either the TS2040 or an 80 column printer (with the correct centronics interfacing). To use it you must have a composite video monitor. For further information send a SASE to John Oliver at the address mentioned previously. THIS HAS BEEN A VERY GOOD MONTH FOR TS1000 USERS!!!!

718-660-6014 WHITE HOUSE
718-699-0861 PALADIN'S PALACE
718-803-1363 ASGARDO
212-496-7948 DRAGONDOM
718-454-1462 FIREFOX I
718-637-2981 OMNI80
718-845-8849 ATARI PALACE
718-464-3434 THE CRYPT BBS
718-351-2399 CORNER PUB
718-596-5802 METRO BBS
718-967-2974 GRAND CENTRAL
212-824-6598 PS SI
212-566-5015 1st BASIS BOARD
718-720-7673 NOVA
212-671-7050 DBUG BBS
718-471-2436 PC PRO-TO-CALL

609 AREA CODE

609-596-2570 B.A.U.D.
609-890-6342 THE TOXIC DUMP

914 AREA CODE

914-042-0366 RMN COMPCOMM
914-343-1734 ACTION ELECTRONICS
914-738-6857 MAM PELHAM T8BS
914-688-3604 DOCS-R-US
914-362-1422 RAMAPO
914-221-2248 ECLECTIC IBM BBS
914-359-1517 SHERWOOD FOREST
914-634-1268 APPLE TREK I
914-835-3627 APPLE TREK II
914-725-4060 APPLE TREK III
914-965-2365 WESTCHESTER BBS
914-679-6559 PCPM SBBS
914-395-0180 MNEMONICS VIDEOTEX
914-693-0293 PORTABLE COMP. MESSAGE SYSTEM

LIST Group

**A LOAD/SAVE SWITCH, TEST TAPES, AZIMUTH
 ALIGNMENT REVISITED and MICRO CARTRIDGES**

 By Cedric R. Bastiaans

Page A

This then is part IV of this series and I will start off by touching upon something that I thought for sure EVERYBODY knew! But I was wrong, and it is thusly useful to once again mention it.

A. LOAD/SAVE SWITCH

It was at a recent LIST-meeting that I witnessed two members of our club trying desperately to LOAD a program into a TS2068. Time after time they were getting the infamous report code "R, Tape loading error" on the screen.

Wanting to help, I approached them and saw that a dual audio cable was inserted (both ends) in the EAR and MIC jacks. I just couldn't believe my eyes; here we are, almost five years after the first Sinclair computer was introduced and early on we had already been warned never to do this, because it would cause a ground loop or signal feedback or what have you, with resulting LOADING and or SAVEing problems. I commented accordingly, got two ignorant stares so I pulled the one plug out of the MIC jack of the computer. After this, the program LOADED without a hitch...

The recommended practice of using only ONE cable at a time, either going from EAR to EAR for LOADING or from MIC to MIC for SAVEing, has been described in the Timex/Sinclair literature I don't know how many times. However, repeated unplugging and insertion of a plug is often not well received - pun intended - by the mechanically not so sturdy two-bit (I refer to the monetary unit, not the binary character) jacks used on the ZX's and the TS's. It is also rather tiring...Therefore, a LOAD/SAVE switch is a much more elegant solution.

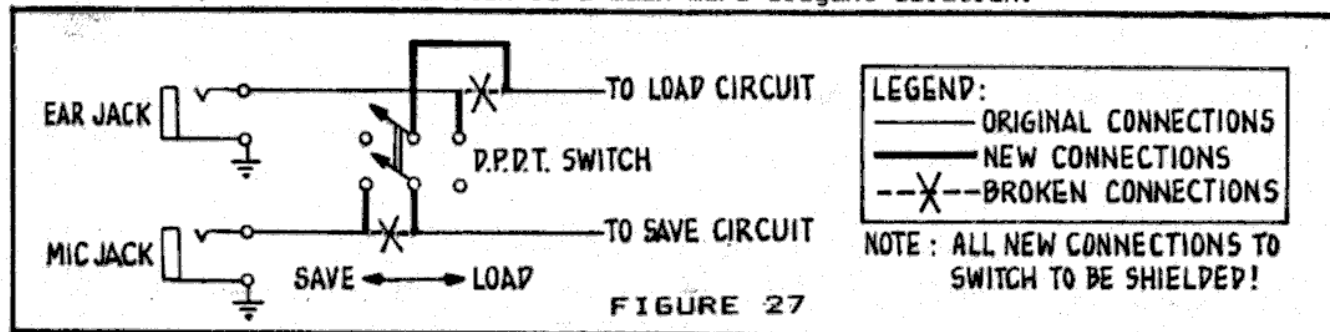


Figure 27 shows a diagram; it is aimed at building such a circuit in the computer case. It therefore requires that you do some unsoldering, cutting and resoldering in the computer. The use of small-diameter 1-conductor shielded cable is recommended; connect the shields together at one point to circuit board ground. It is really very easy, but if you have no idea at all how to proceed, maybe you should not attempt this modification.

Anyway, the two-position switch allows the dual audio cable to stay plugged in at all times, in all four jacks and LOADING and SAVEing take place by setting the switch in the appropriate positions, effectively isolating the EAR and MIC inputs.

B. TEST TAPES

Test tapes are very accurately recorded tapes, indispensable tools for the magnetic tape and equipment industry. They are quite expensive because of the limited market and because of the stringent manufacturing requirements. Dependent on the nature of

the test signals on the tape, they also have a rather severely limited life. They are in other words also quite expensive to use. High frequency signals may after only ten playings become questionable as far as their accuracy of amplitude is concerned!

There are only a few manufacturers of reliable test tapes, even world-wide. TDK of Japan was at one time such a supplier. Unfortunately, they withdrew from this market. I only know of two sources here in the US:

ABE Laboratories, Inc. (ABEX Test Tapes from Japan),
15431 Blackburn Avenue, Norwalk, CA 90650, (213)921-6031

and

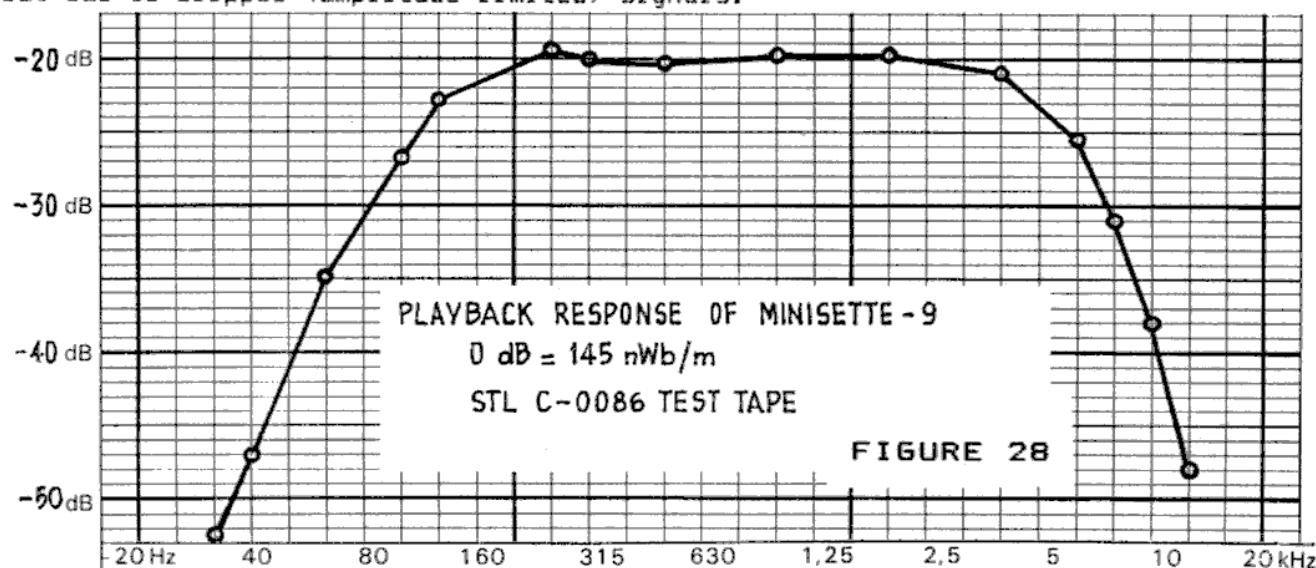
Standard Tape Laboratory, Inc. (STL Test Tapes, US-made),
26120 Eden Landing Road #5, Hayward, CA 94545, (415)786-3546

I have no personal experience yet with ABEX tapes, but it is a reputable laboratory. They have a large selection of cassette test tapes; their cat.# TCC-160 has a 315 Hz signal at reference level, two azimuth adjust signals 6.3 and 10 kHz and thirteen spot frequencies from 31.5 Hz to 10 kHz. A nice touch is that the four highest spot frequencies are repeated, which extends the useable life of this tape. Price is \$40.

STL tapes are of high quality and boast extended frequency range. Their cat.# C-0086 has a 315 Hz reference signal, two azimuth adjust signals of 6.3 and 12.5 kHz and eighteen spot frequencies from 32 Hz to 18 kHz. Price is \$63.

The accuracy with which such professional test tapes are made, reflects in the guaranteed levels, which are typically + and - 0.5 dB for spot frequencies, + and - 0.3 dB for reference signals and azimuth bands are recorded at 90 degrees + and - 2 arcminutes! It is very easy to ruin this accuracy; ALWAYS DEMAGNETIZE heads and capstans before using the test tapes and NEVER FASTWIND (neither fast forward nor rewind) so as to preserve azimuth accuracies (tape stretch!). And be suspicious of any test tape which has been played more than ten times (this refers to frequencies higher than 4 kHz only).

Figure 28 shows the frequency response of the Minisette-9 tape deck, as measured with an STL C-0086 test tape. As was to be expected, it is not any wider in range than the CCR-81. Its sharp pulse playback response must therefore not be anything but due to clipped (amplitude-limited) signals.



Some time ago I came across a cassette test tape, which we will call "El Cheapo", because it sells for an incredibly low \$6.95 and comes in a blister pack!

Need I tell you that I was extremely doubtful of its merits?

The first thing that annoyed me was the fact that the labeled side was "silent"; the test program was recorded on the unlabeled side; so much for quality control...

Then, the signals were recorded in the quarter-track format (stereo), whereas professional test tapes are always recorded across the ENTIRE tape width, unless a different track format is called for because of the nature of the test.

Furthermore, the level of the reference signal had not been specified!

But the real dead give-away that this was not a professional tape was the indication that the equalization was "Standard NAB". Well, I do not know of the NAB (National Association of Broadcasters) ever having been involved in the establishing of Cassette Equalization Standards; I know that there was at least at one time an NAB standard for 1 7/8 ips tape speed, but that was NOT for the Compact Cassette format but for reel-to-reel. At any rate, that particular standard called for equalization time constants of 3180 and 90 microseconds, whereas the accepted IEC Compact Cassette Standard specifies 3180/120 for "Standard" equalization and 3180/70 microseconds for FerroChrome and ChromiumDioxide tapes.

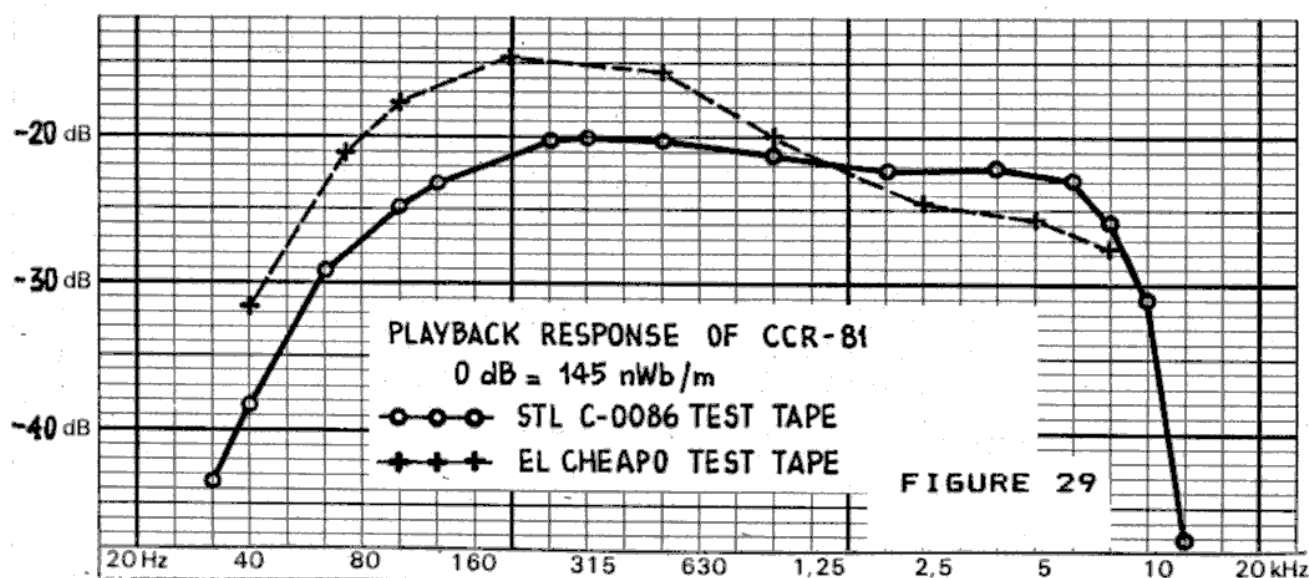
Yet another discrepancy was the reference frequency of 1000 Hz. For the Cassette Format, the accepted reference frequency is 315 Hz (333 Hz in the earlier days before international agreement had been reached on standard frequencies); it was NEVER 1000 Hz!

So I was already quite turned off even before I tried to run the test tape. My chagrin turned into anger when I did play it...

It started with the first band, a 7500 Hz Head Alignment signal which according to the accompanying specification sheet was recorded at a level accuracy of + and - 4 dB. This in itself is not very acceptable for azimuth adjustment. The reality was even worse: the signal varied as much as 12 dB in level and at times even disappeared altogether for very brief periods. IT WOULD BE IMPOSSIBLE TO ADJUST AZIMUTH with this kind of signal.

The FR section with nine spot frequencies in the range of 40 Hz to 8 kHz was fairly stable in the low frequencies, but above 1000 Hz the amplitudes wavered quite a bit also. The level accuracy of this section was stated to be + and - 4 dB too.

The rest of the tape has sections with a sweep frequency test, intermodulation test, channel identification and separation test. I did not bother to even play these.



I still used El Cheapo test tape to measure the response of my CCR-81 deck, carefully noting the peak levels of the wavering high frequencies. The result is shown in Figure 29 and the first thing one notices is the extreme difference with the other curve, which was taken with the STL C-0086 test tape. The latter is within 1 dB from 40 Hz to 10 kHz of the curve shown in Figure 25 of Part III, which was taken with a TDK test tape. That surely is proof of the claimed accuracies of the professional test tapes. But the Cheapo tape... Well, it is commendable if a company tries to bring a test tape to the masses at a reasonable price, but if it is of such terrible quality, it surely would not serve any purpose.

I have been asked by a couple of people to consider making available an inexpensive head alignment tape. I have declined, because I don't have the equipment to make useful and reliable azimuth test tapes.

I am, however, willing to consider supplying high quality C15 cassettes, recorded on one side with a 315 Hz sine wave signal at a reference level of 250 nWb/m, to interested parties with a need to calibrate their tape equipment. I believe I could do this at no more than \$5 per cassette, postpaid 1st Class Insured Mail. This is not going to be a profitable enterprise and I will only do it if there is enough interest. Let me know by writing me at 3 Cassie Court, Mt. Sinai, NY 11766.

C. HEAD ALIGNMENT REVISITED

In Part I, I have expressed my objections to indiscriminate "head tweaking". It is an undesirable technique and should really be left to the professional.

In the following, I will attempt to shed a little light on the ins and outs of azimuth loss, while promising not to become too scientific and mathematical.

Azimuth Loss occurs when both edges of the gap in the playback head are not correctly aligned with the trailing edge of the gap in the recording head. It is, of course, nonexistent in the case of a combined record/playback head, where one and the same gap is used in both recording and subsequent playback. However, in the case of separate heads and where a tape recorded on one machine is played back on another, azimuth becomes important and especially critical at very short wavelengths.

In addition, misalignment may occur in guiding the tape across the heads (so-called tape skew).

If the edges of the reproducing-head gap are parallel but at an angle θ to the trailing edge of the recording-head gap, a loss is introduced into the response, expressed as follows:

$$\text{Azimuth Loss (dB)} = 20 \log \frac{\lambda}{\pi W \tan \theta} \cdot \sin \frac{\pi W \tan \theta}{\lambda}$$

where W = track width

The angle θ is sufficiently small to allow the tangent function to be equal to the angle in radians. Figure 30(a) shows the Azimuth Loss plotted against the parameter $\pi W \theta / \lambda$. Extended plotting will show that on increasing θ from zero in either direction, the response will go through a series of minima and maxima, much like that of a comb filter.

To give you an idea of the magnitude of the error angles involved, compute $\pi W / \lambda$ to be 618, with W equal to .059" and λ equal to .0003" (wavelength of 6300 Hz at 1 7/8 ips). The first "null" in the response of this frequency therefore occurs at an

error angle of about $3/618 = .005$ radians or about 17 arcminutes, quite a small angle, wouldn't you say?

Now this was strictly theoretical, with everything idealized. In practice, the picture is distorted because of a variety of factors. Figure 30(b) shows an experimental curve (loss plotted against error angle), obtained for a medium wavelength ($f=1000$ Hz). The x-scale has been adjusted so the shape of the curve should be similar to that of Figure 30(a), to facilitate comparisons. The match is satisfactory, even though the extreme dips of the theoretical plot don't show up in such severity.

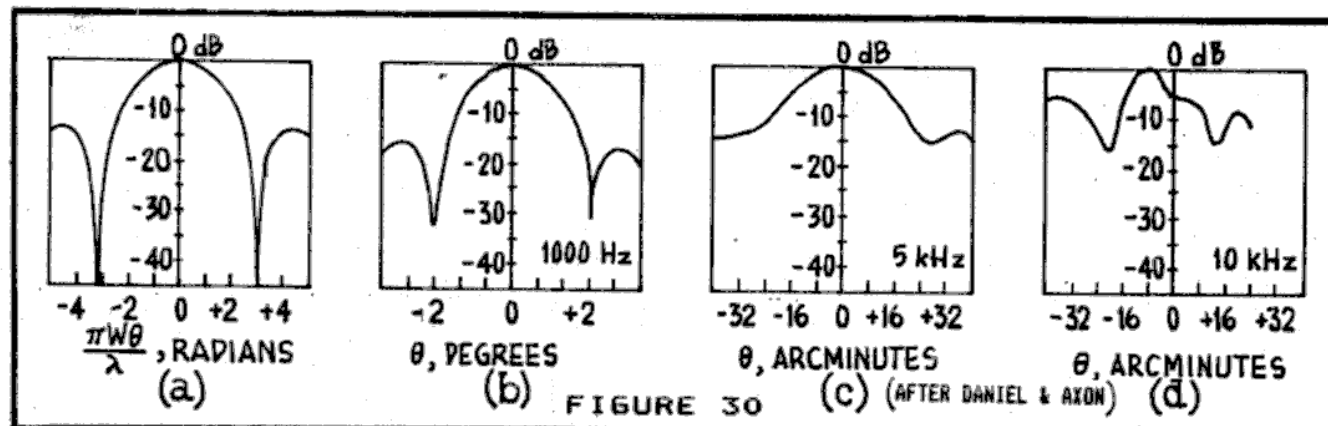


Figure 30(c) shows a similar experimental plot, for a shorter wavelength ($f=5000$ Hz). The match is now not very adequate, but there is still a similarity.

Not so, however, at a very short wavelength ($f=10$ kHz), refer to Figure 30(d). There is very little agreement with the theoretical curve of Figure 30(a)!

We find in this particular experiment that the adjustment for maximum response at 10 kHz is appreciably different from that at 1000 Hz. With the head optimally adjusted at 1000 Hz, we find a loss of 5 dB at 10 kHz. On the other hand, adjusting the head for optimum response at the short wavelength would show a loss of some 2 dB at the medium wavelength.

These anomalies are easily understood if we realize that the head gaps are somewhat irregular! Unless at least one edge of the gap is PERFECTLY STRAIGHT a head can in fact NOT be aligned! All we can aim for is a compromise for best results at a given wavelength.

Realize also that if it is the trailing edge of the recording gap that is irregular and not straight, that this would result in a recorded signal alignment which VARIES across the width of the track! The consequence would be that there is no single azimuth adjustment for the reproduce head to cover the whole wavelength range, even if the playback head would have a perfect gap, straight and parallel.

I hope that I have made it clear that there is more to head alignment than meets the eye. I, as a professional with so many years in magnetic recording/playback research, do not normally touch the head alignment. I have seldom LOADING problems, unless it involves a real bum tape, almost always one with inadequate recorded levels. But then, I DO observe all those "rules" expounded in the preceding installments of this article series, contrary to a good friend of mine, who always has cassettes scattered on his desk, cassettes that are not rewound and not in their cases, lying next to overflowing ashtrays! And then he complains about these very cassettes not LOADING! Oh well...

D. SINCLAIR MICRODRIVE CARTRIDGES

This is the final part of this series and it wouldn't be complete without my

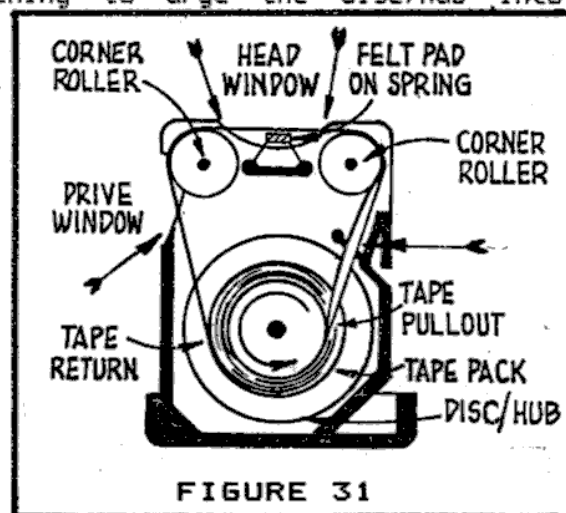
personal (and possibly by some of you considered to be weird and eccentric) opinions about the infamous Microdrive cartridges.

The cartridges are based on the ill-fated Exatron "Stringy Floppy" design of 1980. Since Sir Clive has always been preoccupied with miniaturization, it is not surprising that he took Exatron's design and made it quite a bit smaller. Smaller is not necessarily better, as Xaviera Hollander would say. In my opinion, the Sinclair Microdrive Cartridge is an abomination. But enough of my viewpoints, let me just give you the facts.

Figure 31 shows the innards of a cartridge. A length of twohundred (200) inches of .075" (1.9 mm) wide tape, exactly half the width of cassette tape, .001" thick, is spliced in an endless loop. This loop is loosely wrapped in a pack, around a hub, which is molded onto a flat disc, which could revolve around a spindle and in a recessed circular area. I doubt that this disc/hub would actually rotate during operation. The loose tape pack is nowhere attached to the hub (couldn't be for the kind of operation intended), so there is nothing to urge the disc/hub into rotation.

I am not clear on the tape speed; one source claims 30 ips but another 28 ips. Sir Clive religiously thumbs his nose at any standard, so it is probably 28 ips...

This would mean that the entire tape could pass the head in a little over 7 seconds, but it is unlikely that it would always start at the exact beginning of the tape and a complete pass could therefore take as much as some 14 seconds. I have been told, however, that in practice the transfer of a large program can take as much as 70 seconds. This may be a function of the recorded format, of which I have no knowledge.



There is a theoretical capacity of 255 sectors of 512 bytes each, hence almost 128 kilobytes, allowing for spaces between sectors, quite a large capacity. But after formatting it is of course less, just like floppies.

Straight arrows in the illustration show where the tape may invariably scrape its delicate business surface against the case. As a matter of fact, scraping of the oxide surface takes place continuously during operation, what with the tape rubbing against itself within the tape pack. If this is not self-evident, consider the fact that because of the difference in diameters, the entry speed of the tape onto the pack would be higher than the exit speed where it gets extracted from the pack. This is not compatible with the need to have a CONSTANT tape speed. As a result, the tape has to continuously move WITHIN the pack. And that's why it has to be very loosely wound. If it would be packed tightly like in a cassette or in a reel, it could not possibly move against itself and the whole contraption would jam...The tape is of a special kind, highly calendered and with special solid lubricants in the backing.

The above facts may explain to you why I can not endorse the microcartridges. I have talked to many people in Europe who have used these contraptions extensively and I would almost always hear expressions like "unacceptable alternative to floppies", "unreliable", "a disaster" and some other unprintable opinions.

I wouldn't know; I have never used them, but judge them solely on their design and on that basis, I rank them together with Sinclair's C5, the electric tricycle (he dares call that an electric CAR?), aptly made by the Hoover Co., because it is for SUCKERS...

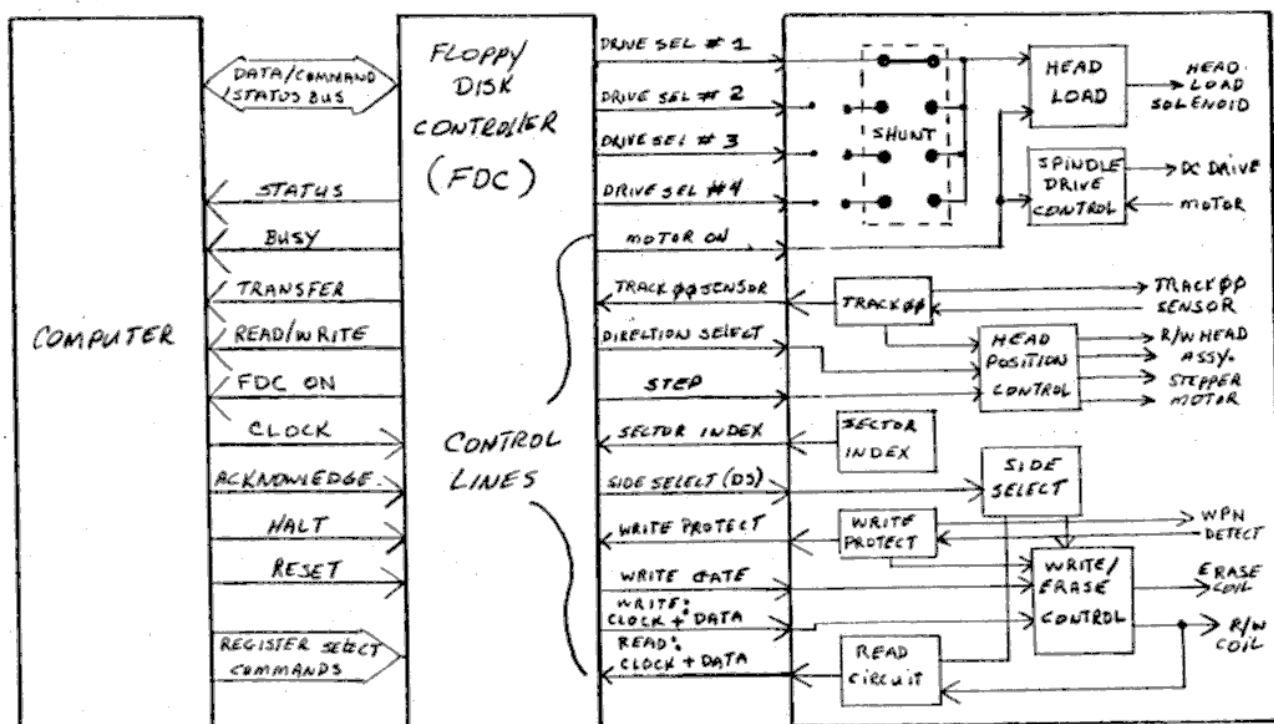
DISK DRIVE CONTROL AND INTERFACING (Part 1)

Part of my makeup is being extremely inquisitive. Disk drives for the 2068 were about to enter my life and I didn't know much about them except placing a disk in a slot and entering a command to operate the system.

I searched through many publications and books for any information which would provide me with enough theory to add to my disk operating systems and keep them going if problems were to occur. By no means do I consider myself an expert in this field, however, I have gathered much information on this subject and have utilized it to support and extend my disk drive systems.

Perhaps you too have the same desires as I, so I have decided to write the following article; "Disk Drive Control And Interfacing".

Part 1 of this article provides information on the 34 pin disk drive connector with a brief explanation of the function of the primary operating pins of this connector. Part 2 will focus on recording methods, formatting and soft sectoring. Part 3 will cover the disk controller.



DIVISION OF THE DISK DRIVE ELECTRONICS

- The disk drive electronics is used for operation of the motors and to process the computer interfacing.
- The computer disk drive interface circuitry is dedicated to monitor the disk drive and its' associated disk controller.

The connections between the disk drive electronics and the computer disk interface electronics is to provide compatibility for the computer industry. 3 inch, 3 1/2 inch and 5 1/4 inch drive connectors use 34 pin pc edge connectors (Shugart compatible). My own personal experience has been with the Remex 5 1/4 inch drives and the Hitachi 3 inch drives which are used with the Aerco disk interface and the Timex Portugal disk operating system respectively.

For those individuals dedicated to "rolling their own" drive assemblies, I have included the following table which explains the most used 34 pin connector functions.

EXPLANATION OF FUNCTIONS

READ DATA, pin 30 - This line passes a stream of pulses to the computer after processing the information from the read head output. The pulses correspond to the pattern of magnetization on the disk as it passes under the read head, wherever it might be on the disk. Note that the read data line presents a stream of pulses, not data. The disk controller provides conversion of pulses to useful data.

INDEX SECTOR, pin 08 - This line is the amplified and "squared up" output index sector. Each time the disk's index hole passes under the index sector a short pulse of approximately 40 ms for a 5 1/4 inch disk is output on this line.

The index sector pulse line is sometimes used by the disk controller to detect the presence of a disk in drives that do not have a ready line. Index sector pulses indicate to the controller that a disk is in place and is spinning.

TRACK ZERO (T00), pin 26 - The T00 line is the output from the track zero switch. It is used by the disk controller to tell when the head is positioned over track zero.

WRITE PROTECT, pin 28 - This line is the output from the write protect switch. The disk controller tests the status of this line to discover if it is permissible to write on the disk.

WRITE GATE, pin 24 - This line sets the drive either to read or write to a disk. If the write gate line is set low then the drive's write electronics are enabled.

WRITE DATA, pin 22 - The write data line is used by the disk controller to send a stream of pulses to the drive's write amplifiers. These pulses only reach the write head if the write gate line has first been set low.

MOTOR ON, pin 06 - This line does exactly what the name suggests. A low on this line turns the drive's motor on and starts the diskette spinning. Some drives do not use this line as their motors are permanently running. Some drives also load the read/write head as the motor is started.

STEP DIRECTION, pin 18 - This line determines the direction that the head will move in response to the next pulse on the step line. If it is low it will move towards the center of the disk.

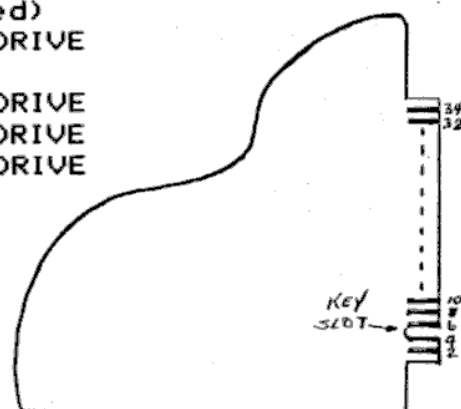
STEP PULSE, pin 20 - This line causes the head to move by one track in the direction determined by the direction select line. A pulse on the step line causes the head to move.

DRIVE SELECT LINES DS1,2,3,4 (D0 - D3), pins 10,12,14 & 06 - The drive select lines (DS1 - DS4) are in use when more than one drive is used. It is normal to connect all of the interface lines to all of the drives; this is "daisy chaining".

The individual drive select lines, DS1 - DS4 are also connected to each drive but only one line is setup to respond to each line. A drive is selected and will respond to the disk controller's commands if its drive select line is low. If the line is high, then all signals on the input lines are ignored and no signals are entered into the output line.

EDGE CONNECTOR PINOUTS

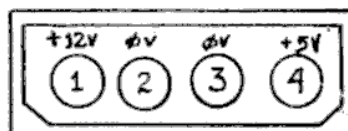
| PIN NO. | FUNCTION |
|---------|---------------------------------|
| 02 | HEAD LOAD/SPARE (not used) |
| 04 | IN USE/HEAD LOAD (not used) |
| 06 | DS4 - DRIVE SELECT 4, "D" DRIVE |
| 08 | INDEX SELECTOR PULSE |
| 10 | DS1 - DRIVE SELECT 1, "A" DRIVE |
| 12 | DS2 - DRIVE SELECT 2, "B" DRIVE |
| 14 | DS3 - DRIVE SELECT 3, "C" DRIVE |
| 16 | MOTOR ON |
| 18 | STEP DIRECTION |
| 20 | STEP PULSE |
| 22 | WRITE DATA |
| 24 | WRITE GATE |
| 26 | TRACK ZERO PULSE (T00) |
| 28 | WRITE PROTECT |
| 30 | READ DATA |
| 32 | SIDE SELECT/RESERVED (not used) |
| 34 | READY |



NOTE: All odd numbered pins are ground returns.

4 PIN POWER CONNECTOR (AMP P/N 350211-1)

PIN 1 +12 VDC
PIN 2 GROUND
PIN 3 GROUND
PIN 4 + 05 VDC



Acknowledgement: Electronics & Computing Monthly -Mike James

J

The following Mail Order firms have what I feel the best buys for disk drive associated hardware, however their supplies may be limited:

Bob Gilder.....

80 COLUMN PRINTER FOR \$20.00?

Yes, it is possible. Using last months centronics interface port, the Gavalin printer mechanism, and a little skill you can have 80 column print from your TIMEX. Details on assembly and software next month. Here is a sample of the Gavalin's print quality:

[illegible]

MUSICAL CHRISTMAS WITH TS-2068

Oleg D. Jefimenko
17 Lakeview Drive
Morgantown, WV 26505

Let your TS 2068 help you to celebrate Christmas. Let it play some Christmas music for you. The program presented here will tell your computer how to play three Christmas songs: the lovely "Silent Night," the joyful "Jingle Bells," and the glorious "Joy to the World." The program allows you to select one of the songs for playing and offers a choice of three play modes: play once, repeat the song, or play the song continuously.*

November 18, 1985

Editor
Sitting
P.O. Box 438
Newport, NY 11721-0438

Dear Sir or Madam:

I am enclosing a note "Musical Christmas with TS 2068" for a possible publication in your newsletter. The program runs very nicely, the music is pleasant, and your readers will definitely enjoy it.

Sincerely yours,

Oleg D. Jefimenko
Oleg D. Jefimenko

S. If you can use the program, please send me a copy of your newsletter with it. If you cannot use it, please return it in the closed SASE.

Thank you Oleg. Just in time for the Holiday season. Your sample issue is on the way.

Long Island
Sincclair Times
Group

*The program is adapted from author's book "30 Music Programs for TS 2068." Publisher's address: P.O. Box 4132, Star City, WV 26505. Price: \$8.00 + \$1.00 s/h.

```
10 BORDER 4: PAPER 6: CLS : FO
R A=0 TO 12
20 PRINT INK 1: "CHRISTMAS MUSI
C": TAB 17: INK 3: "CHRISTMAS MUSI
C": NEXT A
30 PRINT AT 18,1: PAPER 5: "PRE
SS ""ENTER"" TO SELECT A SONG"
40 PAUSE 0
50 CLS : PRINT PAPER 5: "*****
TABLE OF CONTENTS *****": PRI
NT
60 FOR I=1 TO 3: RESTORE I*200
+800: READ N$: PRINT I: TAB 4: N$:
NEXT I
70 PRINT PAPER 5: AT 20,0: "ENTE
R THE NUMBER OF THE COMPOSITION
THAT YOU WANT TO PLAY"
80 INPUT N: CLS : LET Z$=""
90 RESTORE N*200+800: READ N$,
T
100 CLS : PRINT PAPER 5: "*****
*** NOW PLAYING *****": AT 2
1,0: "***** NOW PLAYING *****
****"
110 PRINT AT 10, (31-LEN N$)/2: N
$
120 PRINT PAPER 3: INK 7: AT 20,
0: "TO STOP, PRESS ""SHIFT"" + ""
BREAK""
130 READ F,U: ON ERR GO TO 170
140 IF F<>99 THEN GO TO 160
150 PAUSE T/U*50: GO TO 130
160 BEEP T/U,F: GO TO 130
170 ON ERR RESET : IF Z$="2" TH
EN RESTORE N*200+810: GO TO 130
180 CLS : PAPER 7: PRINT AT 7,0
: "PRESS ""1"" TO PLAY AGAIN.
"
190 PRINT "PRESS ""2"" TO PLAY
CONTINUOUSLY.
"
200 PRINT : "PRESS ""0"" TO PLAY
ANOTHER SONG.
"
210 PAPER 6
220 PAUSE 0: LET Z$=INKEY$: IF
Z$="1" OR Z$="2" THEN GO TO 90
230 IF Z$="0" THEN GO TO 50
1000 DATA "SILENT NIGHT",1.8
1010 DATA 7,8/3,9,8,7,4,4,4/3,7,
8/3,9,8,7,4,4,4/3,14,2,14,4,11,4
/3,12,2,12,4,7,4/3,9,2,9,4,12,8/
3,11,8,9,4,7,8/3
1020 DATA 9,8,7,4,4,4/3,9,2,9,4,
12,8/3,11,8,9,4,7,8/3,9,8,7,4,4,
4/3,14,2,14,4,17,4,14,4,11,4,12,
4/3,16,1,12,4
1030 DATA 7,4,4,4,7,4,5,4,2,4,0,
1
1200 DATA "JINGLE BELLS",.8
1210 DATA 13,4,13,4,13,4,99,4,13
,4,13,4,13,4,99,4,13,4,16,4,9,4,
11,4,13,4/3,99,4,14,4,14,4,14,4,
14,4,14,4,13,4
1220 DATA 13,4,99,4,13,4,11,4,11
,4,13,4,11,4,99,4,16,4,99,4,13,4
,13,4,13,4,99,4,13,4,13,4,13,4,9
9,4,13,4,16,4
1230 DATA 9,4,11,4,13,4/3,99,4,1
4,4,14,4,14,4,14,4,14,4,13,4,13,
4,99,4,16,4,16,4,14,4,11,4,9,4,9
9,4,21,4,99,4
1400 DATA "JOY TO THE WORLD",2.5
1410 DATA 24,4,23,5.33,21,16,19,
2.67,17,8,16,4,14,4,12,8/3,19,8,
21,2.67,21,8,23,2.67,23,8,24,2,9
9,16,24,8,24,8,23,8,21,8,19,8,19
,5.33
1420 DATA 17,16,16,8,24,8,24,8,2
3,8,21,8,19,8,19,5.33,17,16,16,8
,16,8,16,8,16,8,16,8,16,17,16
,19,16/5,99,16,17,16,16,16,14,8
1430 DATA 14,8,14,8,14,16,16,16,
17,16/5,99,16,16,16,14,16,12,8,2
4,4,21,8,19,5.33,17,16,16,8,17,8
,16,4,14,4,12,2
```

Letters to the Editor

PLATA DOLIO, 17 de setiembre de 1985.

L.I. SDC/CLAIR TIMEX (LIST)
GROUP
ATT: PAUL DONNELLY
P.O. BOX 438 CENTERPORT,
NY 11721

Dear Friend

Many thanks for your sample information.

I want to send you a free cassette with programs for the 2068 that you don't have.

I have marked with:

A cross: The programs that I have.

A green dot: The programs that I can copy.

I wait for your election.

I'm including a list of software that is commercialized in my country, with:

A red dot: The software programs are copied with 'TURBO' and I can't copy (but I can get hold of at about 4 US\$ each).

That's all.

I would be very grateful for the following information:

- The different routines of the 2068 have run and his uses.
- The address of Timex Portugal.
- How can I get hold of a Timex 2068 technical manual.

(Please send me a list of your software)

Thanking in advance, Very truly yours.

P.D. As we have restrictions about sending money out of our country, I'm studying the way of sending the money for subscription of your VERY VERY INTERESTING newsletter.

HECTOR JORGE PICONE
CAPITAN DE CORBETA
INGENIERO AERONAUTICO
ARSENAL AERONAUTAL N°1
1919 Base Aeronautal - Putaendio
Argentina

Hector Jorge Picone
Capitan De Corbata
Ingeniero Aeronautico
Arsenal Aeronautal #1
1919 Base Aeronautal - Putaendio
Argentina

Hector:

I have attached some information which may be of help to you.

We have most of the programs you listed already, though Frogger, Quasmodo and Tower of Evil would be interesting to see. My young son is studying Spanish so an arcade game with Spanish instructions (particularly on screen - like menus) might be educational and fun for him.

Unfortunately none of the programs on your list was marked with a cross. Still I assumed the typed list represented your collection. Very impressive.

Timex 2068 technical manuals are available from (Price is \$25.00 in U.S.).

TIMEX MATERIAL SALES
P.O. BOX 1378
LITTLE ROCK, ARK 72103

Do try the attached duplicating technique.

Very truly yours,

How "letters" work - A Bootstrap

We receive dozens of requests for information each month. Some are general in nature, but most ask us specific questions about hardware, software, and compatibility.

Since we don't (and can't) have all the different types of HW & SW available, your editorial staff simply can't answer all the questions raised. We try, e.g., by sending pages from back issues of LISTING or referring the questions to another source of information, but we need your help.

If you see a question in the letters section, and you know the answer, please send the answer to LISTING and/or the individual. If you send it to us, we'll publish it and pass it on.

Oh yes, we don't print members' street addresses unless told specifically to do so.



MYLES COHEN

NY, NY 10128

7 NOV 85

PAUL DONNELLY
P.O. BOX 438
CENTERPORT, NY 11721

DEAR PAUL,

HERE IS THE PROTOCOL FOR THE LIST DATA-BASE. I PROMISED JEFF STREET THAT I WOULD THINK ABOUT AND CONSTRUCT A FORMAT USING PRO/FILE 2068 AS A VEHICLE.

I DON'T HAVE JEFF'S ADDRESS. WILL YOU GIVE THESE DOCUMENTS TO HIM. I HAVE ENCLOSED 2 PRINTOUTS OF INFORMATION AS THE DATA-BASE MIGHT PRINT THEM OUT. THE SMALLER ONE IS JUST AN INDEX OF THE TITLES OF EACH ARTICLE (THE FIRST LINE OF EACH FILE CARD). THE LARGER ONE IS A COMPLETE PRINTOUT OF ALL THE FILE CARDS THAT I HAVE INPUT SO FAR. EACH FILE CARD BEGINS WITH A ">".

IF THERE ARE ANY QUESTIONS OR SUGGESTIONS FOR IMPROVEMENT, PLEASE FEEL FREE TO CALL ME AT (212) 427 0179.

I'M SORRY I WAS NOT ABLE TO BE AT YOUR LAST MEETING BUT MY TRANSPORTATION USUALLY DEPENDS ON STONY M. IF FOR SOME REASON HE IS UNABLE TO COME THEN, OF COURSE, SO AM I (AND 2 OR 3 OTHERS). I WONDER IF THERE IS ANY CLUB MEMBER WITH A CAR WHO LIVES IN THE CITY THAT I MIGHT CALL AS AN ALTERNATE...IF STONY IS NOT AVAILABLE, I'VE MISSED 2 MEETINGS SINCE I BECAME A MEMBER AND I REALLY FEEL AT A LOSS WHEN THAT HAPPENS.

THE LIST TAPES ARE A MARVELOUS IDEA---LIKE GETTING A BUNCH OF CHRISTMAS OR BIRTHDAY PRESENTS. YOUR NEWSLETTER IS CHOCK FULL OF GOODIES EVERY MONTH, AND THE PEOPLE ARE NICE. I HOPE YOU ARE AS PROUD AS YOU SHOULD BE. I KNOW I FEEL VERY GOOD ABOUT BEING A MEMBER OF YOUR FINE GROUP.

BEST REGARDS TO ALL,

Myles
MYLES C. COHEN

Miles:

Thank you not only for the kind words, but for the great job you're doing on the data-base. Miles' work in progress; data entry instructions and the first entries are on the next two pages. We'll keep the members posted on his progress.

With luck, the first Pro-file data file will be ready for tape #5

P.D.

IAN F. ROBERTSON

Islington, Ont.
M9A 2M8 Canada
416-733-4346

August 18, 1985

LIST Group
P.O. Box 438
CENTERPORT
NY 11721-0438
U.S.A.

Attention: Paul Donnelly

Dear Paul:

I am enclosing a copy of my column from the August issue of SINC-LINK (Toronto TS Users newsletter) for your perusal.

It is such a treat to have so many good things to report on that I want to share with all the other TS Users Groups that I either belong to or subscribe to the newsletter.

Hope there is something of interest to you in the column.

Yours in TS Computing,

Ian F. Robertson
Ian F. Robertson

P.D. Thanks, your article is reprinted herein.

Ian:

ENTER INFORMATION INTO THE DATA-BASE

BY MYLES COHEN

When you press "A" on Pro/file's menu and ENTER, you get a blank screen with a blinking cursor on top. You can think of this screen as a single blank file card. The cursor is your pencil to fill in the entries on that card. What should those entries be?

Although each file card is blank, you should imagine that every card contains these questions:

NAME OF ARTICLE? (Or purpose)

DESCRIPTION?

NAME OF NEWSLETTER?

DATE OF NEWSLETTER?

VOLUME/ISSUE/PAGE

A sample card might look like this:

LINE CURVE PLOT
1000 UTILITY PROGRAM
THEY PLOTTER
MAY 1985
M3:5:6

The first character on each file card should be a >. It goes just before the name. This helps us when we print out the files.

All entries must be written in upper case (USE CAPITAL LETTERS ONLY)

Now for the DESCRIPTION: if the article deals with the 2068 then 2068 must appear on that filecard

If the article deals with the 1000 or the 1500 or the 1X-81 then 1000 should be on that card. If the article is about the QL then use QL. Most file cards will contain either 2068 or 1000 as an entry and sometimes both.

If it is about or concerns Machine Code then MC should appear.

If it is a program - use the word PROGRAM.

If it's a game - use the word GAME.

If the program is not a game then it probably is a utility, so use the word UTILITY.

There are programs that are neither games nor utilities. They usually are short and have such titles as TRY THIS... These can be listed as FUN.

If it tells you how to build hardware then use the words HARDWARE FR QWERT.

If it is a review of a book or a software program or a piece of equipment then use the words BOOK, SOFTWARE, or HARDWARE along with the word REVIEW.

If it is a bunch of suggestions on how to do different things use the word TIPS.

If it explains over several paragraphs how to do something better, TUTORIAL is the word to use.

If it doesn't fit any of these, use INFORMATION.

Every card should also have the NAME of the Newsletter as well as its DATE, VOLUME, NUMBER, and ISSUE NUMBER. These are usually located under the newsletter's title on the front page. Then add the PAGE NUMBER of the article. Separate these numbers with colons. A file card such as:

FORMAT THE DATA FILE WITH PRO/FILE

FORBES

TUTORIAL NEWSLETTER

VOLUME 1, 8

APR/MAY

1985

PAGE 27

tells us that an article about formatting a data file using Pro/file on the 2068 can be found in the April/May issue of the LIST group's news letter. The word tutorial means that it goes on at length about it. The 1:8:27 tells us that it is the first year of publication, and the fifth issue of that year. The last number tells us that the article can be found on page 27 of that issue. It packs a lot of info in a short space. But what if you don't know the name of the newsletter?

TO FIND THE PAGE JUST LOOK AT THE NUMBER AFTER THE LAST COLON

To close your file card-- Just press "STOP". Now the card is in the memory and can be searched for from the menu by using any word or group of letters as it appears on the card. To start another card, go back to the menu and press "A".

GOOD LUCK!

L.I.S.T. User Group
Centerport, NY 11721-0438

Dear Sirs:

I have enclosed a few tidbits which you may care to publish in your newsletter. The first is a short story, "The Last of the 2068s", which I wrote for the L.I.S.T. newsletter. The second is a short story, "The Last of the 2068s", which I wrote for the L.I.S.T. newsletter. The third is a short story, "The Last of the 2068s", which I wrote for the L.I.S.T. newsletter. The fourth is a short story, "The Last of the 2068s", which I wrote for the L.I.S.T. newsletter. The fifth is a short story, "The Last of the 2068s", which I wrote for the L.I.S.T. newsletter. The sixth is a short story, "The Last of the 2068s", which I wrote for the L.I.S.T. newsletter. The seventh is a short story, "The Last of the 2068s", which I wrote for the L.I.S.T. newsletter. The eighth is a short story, "The Last of the 2068s", which I wrote for the L.I.S.T. newsletter. The ninth is a short story, "The Last of the 2068s", which I wrote for the L.I.S.T. newsletter. The tenth is a short story, "The Last of the 2068s", which I wrote for the L.I.S.T. newsletter.

I don't expect most people to read this, but I thought I would write it. I don't expect most people to read this, but I thought I would write it. I don't expect most people to read this, but I thought I would write it. I don't expect most people to read this, but I thought I would write it. I don't expect most people to read this, but I thought I would write it. I don't expect most people to read this, but I thought I would write it. I don't expect most people to read this, but I thought I would write it. I don't expect most people to read this, but I thought I would write it. I don't expect most people to read this, but I thought I would write it. I don't expect most people to read this, but I thought I would write it.

William:

You bet we'd like to see your series. A complimentary copy of this months newsletter is being sent to you - Paul D.

Respectfully yours,
William J. Cohen
L.I.S.T. User Group
Centerport, NY 11721-0438

10/15/85

ALBERTSON COMMUNICATIONS, INC.

HAWAIIAN HONOLULU, HI 96813
914 495-7727

OCTOBER 16, 1985

T.S. SERVICES
NATIONAL TS USERS NETWORK
PO BOX 15214
RED BANK, TN 37415-214

GENTLEMEN:

YOU CERTAINLY ARE FOLLOWING IN THE FOOTSTEPS OF THE DECEASED
TIMEX/SINCLAIR ORGANIZATION...

IT IS NOW FOUR MONTHS SINCE I SENT YOU A CHECK IN THE AMOUNT
OF \$38.50...FOR WHICH I RECEIVED PRACTICALLY NOTHING TO SPEAK
OF... NO BACK ISSUES OF YOUR NEWSLETTERS FOR WHICH I PAID YOU.
ON ANY OF THE OTHER MATERIAL I WAS TO RECEIVE...

IN ADDITION I SENT YOU A CHECK IN THE AMOUNT OF \$48.85 TWO
MONTHS AGO FOR SOME SPECTRUM PROGRAMS LISTED IN THE ONLY
NEWSLETTER I EVER RECEIVED...AND AGAIN HAVE YET TO RECEIVE A
ACKNOWLEDGEMENT...

ALSO NO REPLY TO MY LETTER OF AUGUST 9, 1985

VERY TRULY YOURS,

Stan Nagrod

CC: L.I.S.T.

COPY

Stan:

We hope to print TSS's reply next month.

LIST (LONG ISLAND SINCLAIR/TIMEX)
GROUP, POB 438, Centerport, NY 11721-
0438. Monthly newsletter and meetings.
library of member-generated software.
Annual dues: \$15. *****

Budget Robotics & Computing
Box 18616
Tucson, AZ 85731
Check/MO Postpaid USA & Canada

NOTE

B. R. & C. products are aimed at
computer memory & function expansion.
Uses of the boards have
been described in home control
articles published in (Jul-Aug 83
& Jan-Feb 84 SYNC magazine).
They are also used in the soon to
be published "BUILD A MICROCOM-
PUTER - CONTROLLED ROBOT" by B.
Taylor and published by TAB Books

LIST Associates
PO Box 438
Centerport, NY 11721-0438
Check/MO Postpaid

Item # 1475

Spectrum ROM's

TS-2068 \$19.95
LIST GROUP members price \$18.00
ROMS

It takes 5 minutes to open a 2068
& insert a Spectrum ROM in the
Timex home ROM socket. No solder-
ing necessary. Your unit is then
95% Spectrum software compatible.

NOTE: LIST Associates is not an
official part of LIST GROUP
It's a cooperative buying service
From time to time other items are
offered.

Frank J. Orosz
1604 Pagel
Lincoln Park, MI 48146
Check/MO S/H \$1.00

Item # 1477

Timex Sinclair - Brother EP20

Interface
ZX-81 (plans & list) \$10.00
Interface

With the plans and software list-
ing in this package you are able
to use the Brother EP20 type-
writer on your ZX-81. With modi-
fication use as an input/output
device reading 8 lines in & 8 out

LIST GROUP
PO Box 438
Centerport, NY 11721-0438
Check/MO

Item # 1476

LIST is a non-profit user group.
A monthly newsletter (currently
24 photo-reduced pages) and meet-
ings are used to provide communi-
cation between members and foster
computer literacy for all. Annual
dues \$15.00 includes newsletter.

Sirs:

I've been reading Inside the Timex Sinclair 2000 Computer by Jeff Naylor & Diane Rogers.
From what they say the SCLD chip is the workhorse of TS2068 and you LISTers or Silicon
Valley TSUG or Doug Dewey (you know, somebody I respected) said the SCLD was not being
made any longer. What are we going to do - lose the kingdom for the want of a chip?
What I want to hear is N. Pashtoon has stockpiled these in among his cuff links. Assurances
that SCLD's are durable are of no avail. Mine started feeling fragile and exclusive
instantly. - J. Kraly

Joan K.

Sorry, but SCLD's are as scarce as hen's teeth. The only real insurance is to buy a
spare 2068. That is what Nazir and I have done. Timex, in Arkansas, may have some but
I doubt they'll sell you one. This is another reason for considering the Spectrum. It's
SCLD is reportedly available in the UK. If you run the majority of your applications on
a Spectrum or emulated 2068 you can still find a backup. See Ian Robertson's comments
on repairs. - Paul D.

NOTE: THE SCLD'S ARE NOT COMPATIBLE.

Dear Paul:

A couple items now that I'm back in Florida after a summer of banging around up North.

1st - I'm fairly sure I sent you an address change if not here it is: Marinus Heuseveldt

Lantana, FL 33462

2nd - I'm not sure when my membership subscription expires, so enclosed is a check for
\$15.00 - Please extend - Thanks.

3rd - You are to be commended on the quality of material in LIST. In particular Cedric
Bastiaans deserves a "Big Pat on the Back" his articles on Loading are SUPER. This is
the kind of stuff that is really useable. - Sincerely Marinus Heuseveldt

Marinus:

We second your "thank you" to Cedric. See his concluding article this month. - P.D.

From D.Lipinski's Software Buyer Guide. Note that ROM's are down to \$13-12 for members.

ABILENE TSUG where are you? The last 3 issues we've sent have been returned. Are you
of business, Chris?

Long Island Sinclair Timex Group



Next Time

Sears Monitor Fix
80 Column Printer \$20
Your Program, article or graphic
Part II of Bob Gilder's Disk Drive Series

Kermit the Frog
Star's Dressing Room
The MUPPET SHOW
BOOBTOOB U.S.A.

Dear Kermie,

This is where you write. Copy
templates from line 1050 as you
need them. Watch your language.

Respectfully yours,
Wonderful ME!

```

1 REM 1985 William Pedersen
2 REM
3 LET Who=3100:
  LET Where=2:
  LET Print=1001:
  LIST 1: STOP

8 REM
10 REM This program is for
  casual notes and mailing
  labels if you don't want
  to keep a formal file.

12 REM
100 REM 3001 Pen Pal
  3100 Kermit the Frog

110 REM
112 REM ENTER: LET Who=????
114 REM ENTER: Where=?
  ?=2 for screen
  ?=3 for printer

116 REM
118 REM The following is a
  heading..or label if you
  BREAK at the PAUSE 0.
  ENTER: GO TO Print

120 REM
1001 CLS : GO SUB Who: PAUSE 0
1002 REM
1004 REM Copy the template as
  often as needed for the
  text.

1010 PRINT # Where; "
  This is where you write. Copy
  templates from line 1050 as you
  need them. Watch your language.

1048 REM
1050 PRINT # Where; "

1900 REM
1901 PRINT # Where; "
  Respectfully yours," "
  Wonderful ME!"

1999 STOP : GO TO 1001
2000 REM
2998 REM Add your headings at
  100 and here.

3000 REM
3001 PRINT # Where;"Pen Pal""AL
CATRAZ""Alcatraz Island, CA 773
440""Dear Birdy,"": RETURN
3100 PRINT # Where;"Kermit the F
rog""Star's Dressing Room""The
MUPPET SHOW""BOOBTOOB U.S.A.""
"Dear Kermie,"": RETURN
3102 PRINT # Where;"TEMPLATE""
""""""""Dear ?,"": RETURN
3104 REM
4001 SAVE "NOTE PAD" LINE 1
4003 SAVE "NOTE PAD" LINE 1
4005 STOP

```

```

=====
1 REM 1985 William Pedersen
2 REM
4 REM OVERPRINTING
6 REM This test demonstrates
  the way the INVERSE and
  OVER functions effect
  what you can put on the
  screen.

8 REM
10 REM A$ represents what is
  already there.

12 REM
14 REM B$ is what you write
  on top of it."

16 REM
18 REM The binary number in
  front of the results is
  made up from the OVER
  and INVERSE values.

20 REM
22 REM If you like what you
  get, you can BREAK and
  GO TO 2000. Then you
  can assign it as a UDG.

24 REM
26 REM DOUBLE STATE
28 REM
1001 LET X$="(## ,##)##(## ,
  ##)"
1003 LET Y$="( 00, 00)##(## ,
  ##)"
1005 CLS : PRINT ""Try: X$ for
  A$, Y$ for B$."""(DELETE both
  quote marks first.)"
1007 INPUT "A$=";A$;"B$=";B$
1009 PRINT "A$=";"A$;"B$=";"B$;"
  B$=";"B$;"B$=";"B$;"
1011 FOR o=0 TO 1: FOR i=0 TO 1
1013 PRINT AT 13+2*(i+o+0),0;0;i
  ;"
  ;A$
1015 PRINT AT 13+2*(i+o+0),5;OV
  ER 0; INVERSE i;B$;
1017 NEXT i: NEXT o
1019 PAUSE 0: GO TO 1005
1996 REM
1998 REM LESS UDG
2000 REM
2001 INPUT "Which UDG character?
  ";a$
2003 LET Addr=USR a$
2005 FOR j=0 TO 7
2007 POKE Addr+j,PEEK (20517+256
  *j)
2009 NEXT j
2011 PRINT AT 20,0;"UDG's:";BRI
  GHT 1;"BCDEFGHIJKL,MNOPQRSTU"
2013 PAUSE 0: GO TO 1005

```

```

=====
3000 REM GREY SCALE GRAPHICS
3002 PRINT AT 11,12; FLASH 1;" W
  ORKING "
3005 LET Grey=USR "A"
3010 FOR n=Grey TO Grey+8*17-1
3015 POKE n,0
3020 NEXT n: RESTORE 3100
3025 FOR n=1 TO 16
3030 LET Here=Grey+8*n
3035 FOR j=0 TO 7
3040 POKE Here+j,PEEK (Here+j-8)
3045 NEXT j
3050 READ U,V: POKE Here+U,V: PO
  KE Here+U+4,V
3055 NEXT n
3060 GO TO 1000
3100 DATA 2,12,0,192,0,204,2,204
  ,1,48,3,3,3,51,1,51,0,252,2,143,
  2,255,0,255,3,63,1,242,3,255,1,2
  55

```

LIST Group

HACKER'S NOTEBOOK

Engineering Chart Sheets

Sheet No. of

File

App.

Date 11/12/85

By P.D. ©1985

Subject HACKER'S NB. - EP-44 TO IF ONE
INTERFACE CABLE

RS232 connections

The RS232 socket is wired as follows:

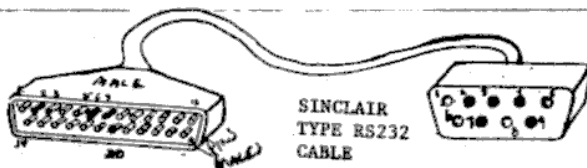
1. No connection
2. TX data (input)
3. RX data (output)
4. DTR (input) this should be high when ready
5. CTS (output) this should be high when ready
6. n.c.
7. Ground (pull down)
8. n.c.
9. +9v (pull up)



An RS232 cable is available from Sinclair Research, which connects the 9 way D-socket to a 25 way D-plug (25 way D-sockets are common on RS232 peripherals). For details of how to obtain this cable, see the software and peripherals catalogue included with the ZX Interface 1. This cable is wired as follows:

2. TX data
3. RX data
5. CTS
6. +9v (normally DSR)
7. Ground
- 20 DTR

SINCLAIR
INTERFACE 1



25 - PIN

SD (SEND) 2
RD (REC) 3
CS 5
DR (DSR) 6
+ 7
-ER 20

D →
← D
CTS ←
DSR ←
GROUND
ER →

9 - PIN

2 TX (IN)
3 RX (OUT)
5
9 DSR (+9V)
7
4 DTR

INTERFACING THE EP-44 & IF ONE

All you need for this connection is a cable like the one shown above and a little software. (Note that this cable is different from one shown for Byte Back). The reason for this is the question of whether each piece connected is DCE (data communications equipment e.g., a modem) or DTE (data terminal equipment e.g., a keyboard). If you're not sure, switch lines 2 & 3.

LIST Group

HACKERS NOTE BOOK

P

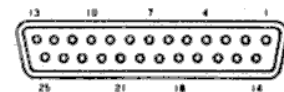
December

3-3 Connector and pin arrangement

| Terminal number | Signal name | Code | EP-connected device | Function summary | Note |
|-----------------|-----------------|------|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
| 2 | Send Data | SD | → | Data line sent from this printer to connected terminal | |
| 3 | Receive Data | RD | ← | Data line sent from connected terminal to this printer | |
| 4 | Request to Send | RS | → | Controls transmission carrier ON: carrier output OFF: carrier stop | Normally ON in the terminal mode |
| 5 | Clear to Send | CS | ← | Controls data transmission ON: data transmission possible OFF: data transmission not possible | |
| 6 | Data set Ready | DR | ← | Indicates condition of connected device ON: transmission/reception possible at connected device OFF: transmission/reception not possible at connected device | ON when cable is not connected |
| 7 | Signal Ground | SG | ↔ | Provides basic ground potential | |
| 8 | Carrier Detect | CD | ← | Detects carrier ON: receiving access signal OFF: not receiving access signal | ON when cable is not connected |
| 20 | External Ready | ER | → | Indicates condition of this printer ON: printer preparation completed OFF: printer preparation not completed | Enables on/off setting selection. ON unless otherwise specified. |

ON : +V
OFF : -V

BROTHER EP-44



(RS-232C) connector

NOTE: Hand shaking

(1) Reception

• Reception is possible when DR and CD are ON; reception data is ignored at other times.

• If ER is set, ER line is ON when data can be received, but becomes OFF when busy (print buffer remainder is low and data cannot be received).

(2) Transmission

• Data is transmitted when DR and CS are ON.

```

1 REM This is a test of the IF1 and EP44
5 FORMAT "I";110
10 OPEN #3,"I"
20 REM Here comes the Listing to the printer
23 REM Settings should be:110,8,N,CR-LF,7BIT,Y
29 LLIST
30 LIST 100
99 STOP
100 REM Now we print to the screen, what was in the EP44's memory
101 REM Just hit "text" on the '44
103 REM and GOTO 100 on the Spectrum
105 OPEN #4,"I"
110 PRINT INKEY$#4;
120 GO TO 110
999 STOP
1000 CLOSE #4: CLOSE #3
    
```

PRODUCT:
FROM:

PRICE:

FUNCTION:
FOR:

INTERFACE III
IN U.S.A. - BOB DYLAN - ENGLISH MICRO CONNECTION
IN U.K. - EVESHAM MICRO CENTRE, BRIDGE ST. EVESHAM, WORCS. WR 11484
\$ 60.00 - U.S.A.
\$ 40.00 - U.K.
TAPE BACKUP & MICRODRIVE TRANSFER
SPECTRUM COMPATIBLES

To begin with, IF3 is not made by Sinclair. It is however, aptly named as the next most needed peripheral after IF one (microdrives & RS232 port) and IF two (joysticks). IF3 is a hardware program copying device which can provide working copies, on tape or microdrive, of any Spectrum program.

The unit is housed in a small black (hobbyboard) box, which sports a female edge connector (Spectrum bus only) and a red momentary contact push button. Concise but complete instructions are supplied on a photo-reduced, one-page sheet. A software cassette, which enables final transfer to either medium, is also provided.

Using IF3 is straightforward, albeit a little awkward. First, of course, IF3 must be connected to your Spectrum compatible (e.g., Spectrum ROM & Z-LINK), the program you wish to copy is then loaded as normal. The program can be used, played and even reconfigured (e.g., as in printer drivers, joystick options). When you get to a point in the program where you'd like to save the game, all you do is push the red button. The program is immediately interrupted or "frozen" at that exact stage. The next step is to cue up a blank tape, set your recorder to record and hit a key. A "conversion copy" of the program is now placed on the tape.

It is at this point where IF3 becomes somewhat awkward to use. Once the copy is made, the system locks up. You must power down, attach IF 1, if you wish a microdrive copy, and load the converter tape and then the "conversion" copy into your Spectrum. The instructions take you through this, step-by-step, and are easy to follow but, as we said, awkward.

You will lose part or all of the screen graphics from the point where you stopped the program. The middle third is always gone. If the program uses permanent artifacts at that part of the screen (i.e., loads a SCREEN\$ and then never clears that background) you'll have to be able to live without it.

You are asked whether you wish to save the "broken" program to tape or M-drive. Once your selection is made, LOADING and SAVING is automatic. Et Voila, you have working copy of the program. I have yet to find a program which could not be copied using IF3.

All is not sweetness and light, however. In addition to having to follow an awkward, 2 step process, and losing part of one screen, you must make copies one at a time. This means that if you want a microdrive copy for now and a archival tape copy, you must do the whole thing twice. There is really no need for the system to "crash" (which it does) after each SAVE. It is probably easier to use a header reader on the copy to produce more. I also found that missing 1/3 of the screen was annoying while playing Shadowfire. The instructions acknowledge one "Squash" game where the SCREEN\$ must be regenerated. This gives instructions, but this adds even another step to the procedure.

Some observations:

- 1) Know the program you wish to copy. Took for a screen where missing the middle third won't matter.
- 2) You can save the program without the screen data. This saves tape, but means the program comes "up" with a blank screen. It was a "Hit any Key to Proceed" screen, that message won't be there.
- 3) Stop the program after any copy protection schemes. For instance, if you have to enter a code to play a game enter the code, and then push the "freeze" button. This way you won't need the silly charts any longer.

Despite its somewhat awkward procedures, I was quite impressed with IF3. It is the hardware "Ultimate Solution" to making backup copies of your software. It is simple to operate and need not be connected to the Spectrum after the backup is made. The fact that it must be used, and the whole repeated, for each copy needed, makes it impractical for wholesale tape copying and should discourage its use by potential pirates. I rate the IF3 a 9.8 out of 10. The two nit-picking tenths are deducted for: 1) price - the unit should cost between \$10-15 less than it does. 2) difficulty of use - at the \$60 price, an EPROM, overlaying screen memory, could have been used instead of the translator tape. Still, I'm not complaining. IF3 is one of the top two peripherals I own.*

@Copyright 1985
P. Donnelly

* Well, actually I haven't sent the check in yet. That is also why I haven't taken the unit apart. Once I own it, I'll describe what I find inside.

I've peeked, there are 6 74LS logic chips, a 2114, 74 S472, and 28 4403 to hold ROMS up. Haven't checked the circuit traces yet, but I'd suspect the 2114 can be mapped onto the screen or some other "secret" place to provide a scratch pad. Using the screen is a classic hackers technique.

BARCAIN CORNER

Seem a good deal! Share the news. Send a postcard to Bargain Corner & LIST BOX 438, CENTERPORT, N.Y. 11721-0438.

This month we have:

Sinclair QL - \$289 includes shipping
(279 ea for 2 or more)

Sharp's
Rt 10 Box 459
Mechanicville, Va. 23111

Brother EP-44 - \$124. - #4.55/3
R: 110 - Melville

47th St. Photo
Toys-R-US

Sony C-15 cassettes - \$49

Service Merchandise
Rt 110 - Melville

Sony C-60 - \$6.49/10
CH890 - 8.79/10

P. Z. Richards
Most stores

Sinclair C-5 - \$395 - Kit
\$495 - Assembled

New Power, Inc.
64 Foundry St.
Keene, N.H. 03432

Gorham Banana - \$89 + \$8 P&H
Printer
(S or P IF)

DAK
8200 Remmet Avenue
Canoga Pk, Ca 91304
800-325-0800

Cavalier "Centronics"
mechanism \$19.95 + (S&H)

Part #5223-American Design Components
62 Joseph Street
Moonachie, N.J. 07074
1-(800) 524-0809

LISTing Policy:

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One "Sample" copy sent upon receipt of large SASE.

Copies provided on exchange basis with other bona fide user groups.

L.I.S.T.ing is published monthly by LIST (Long Island Sinclair Timex) Group,
a non-for-profit users group.

NOTE: PARTIAL YEAR MEMBERSHIPS AVAILABLE

Normal membership year is Feb. through Jan. at cost of \$15.00 (US)
By keeping as many members as possible on that basis, we keep our
costs and chances of error down.

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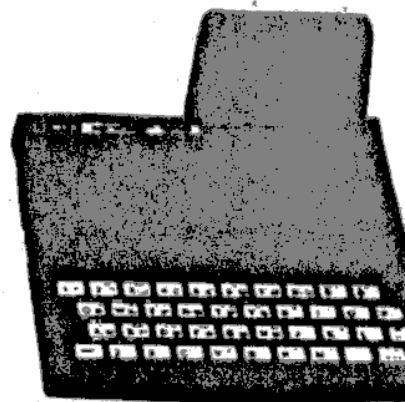
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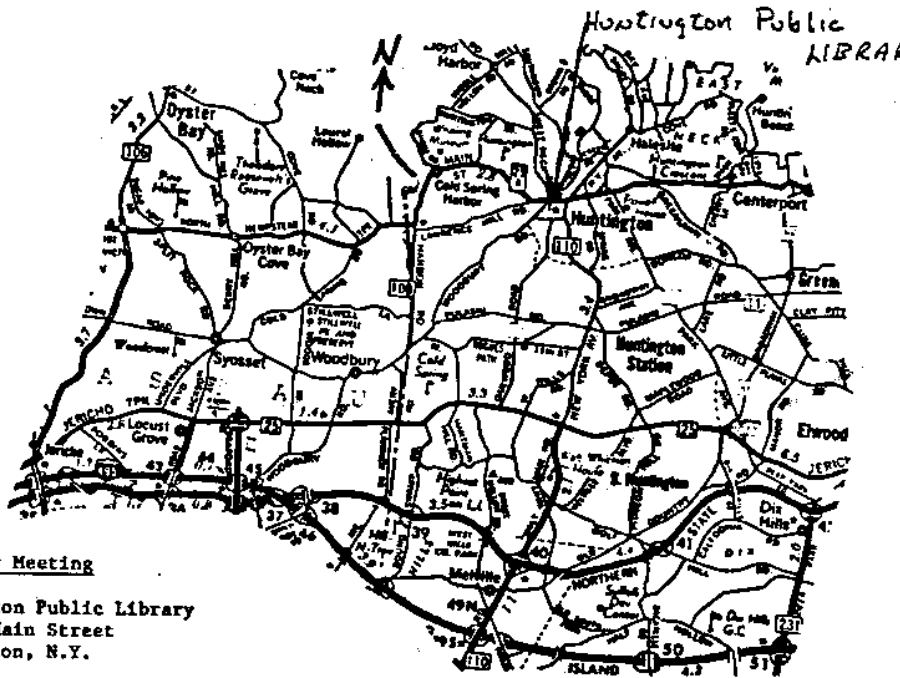
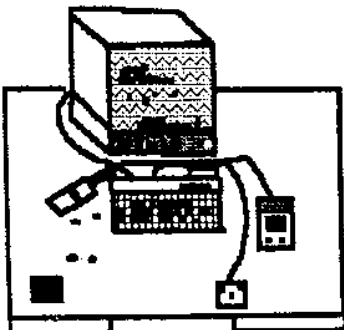
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